L Number	Hits	Search Text	DB	Time stamp
1	4355444	clock distribution circuit	USPAT;	2004/03/18 17:14
			US-PGPUB;	2
			EPO; JPO;	
			DERWENT;	
			IBM_TDB	
2	2303156	phase detector\$1	USPAT;	2004/03/18 17:15
			US-PGPUB;	
			EPO; JPO;	
i			DERWENT;	
			IBM_TDB	
3	453025	(clock distribution circuit) with (phase detector\$1)	USPAT;	2004/03/18 17:19
			US-PGPUB;	
			EPO; JPO;	
			DERWENT;	
	4640400		IBM_TDB	2004/20/40 47 74
4	1643180	generat\$3 and (clock signal\$1 with error signal\$1)	USPAT;	2004/03/18 17:21
			US-PGPUB;	
			EPO; JPO;	
			DERWENT;	
5	233141	((alack distribution singuit) with (phase detector(1)) and	IBM_TDB	2004/02/10 17:25
ا	233141	((clock distribution circuit) with (phase detector\$1)) and (generat\$3 and (clock signal\$1 with error signal\$1))	USPAT;	2004/03/18 17:25
		(generacips and (clock signalip) with error signalip))	US-PGPUB; EPO; JPO;	
			DERWENT;	
			IBM_TDB	
6	4682306	loop filter circuit	USPAT;	2004/03/18 17:26
"	1002300	100p filter circuit	US-PGPUB;	2004/05/10 17.20
		,	EPO; JPO;	
			DERWENT;	
			IBM_TDB	
7	224627	(((clock distribution circuit) with (phase detector\$1)) and	USPAT;	2004/03/18 17:30
		(generat\$3 and (clock signal\$1 with error signal\$1))) and (loop	US-PGPUB;	-00 1, 00, 10 17 100
		filter circuit)	EPO; JPO;	
		,	DERWENT;	
			IBM_TDB	
8	1221430	pulse generator\$1 and (pulse signal\$1 with clock signal\$1)	USPAT;	2004/03/18 17:33
			US-PGPUB;	
			EPO; JPO;	
			DERWENT;	
			IBM_TDB	
9	152267	((((clock distribution circuit) with (phase detector\$1)) and	USPAT;	2004/03/18 17:40
		(generat\$3 and (clock signal\$1 with error signal\$1))) and (loop	US-PGPUB;	
		filter circuit)) and (pulse generator\$1 and (pulse signal\$1 with	EPO; JPO;	
		clock signal\$1))	DERWENT;	
			IBM_TDB	I

10	622		USPAT;	2004/03/18 17:42
		"6066969"	US-PGPUB;	
		"6088255"	EPO; JPO;	
		"4816700"	DERWENT;	
		"5870595"	IBM_TDB	
		"6041073"	_	
		"4475085"		
		"5212410"		
		"5630102"		
		"5920222"		
		"5952857"		
		"6239647"		
		"4415984"	İ	
		" 44 79216"		
		RE31828		
		"4613828"		
		"4801819" "4905006"		
		"5210546" "5257204"		
		"5257294"		
		"5359232"		
		"5459762"		
		"5600839"		
		"5612980"		
		"5621705"		
		"5628019"		
		"5633879 "		
		"5646672"		
		"5724360"		
		"5774321"		
		"5787261"		
		"5805603"		
		"5901116"		
		"6052004"		
		"6058152"		
		"6078225"		
		"6094076"		
		"6160542"		
		"4361897"		
		"4375088"		
		"4376268"		
		"4399412"		
		"4454607"		
		4454607 "4499459"		
		" 4499459" "4512028"		
		"4527075" "4542247"		
		"4542347"		
		"4547667" "4557666"		
		"4557606"		
	j	"4580047"		
		"4580046"		
				1

12	70917	(((((clock distribution circuit) with (phase detector\$1)) and (generat\$3 and (clock signal\$1 with error signal\$1))) and (loop filter circuit)) and (pulse generator\$1 and (pulse signal\$1 with clock signal\$1))) and ("6066969" "6088255" "4816700" "5870595" "6041073" "4475085" "5212410" "56330102" "592022" "5952857" "6239647" "4415984" "4479216" RE31828 "4613828" "4801819" "4905006" "5210546" "5257294" "5359232" "5459762" "5560839" "5612980" "5621705" "5628019" "5633879" "5646672" "5774321" "5787261" "5805603" "5774321" "5787261" "5805603" "6052004" "6058152" "6094076" "6160542" "4375088" "4376268" "4399412" "4458006" "455006" "455006" "455006" "455006" "455006" "455006" "455006" "455006" "455006" "455006" "455004" "45580046") summing and (error signal\$1 with composite error signal\$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2004/03/18 17:42
			US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	230 , 00, 20 27 18

13	24	((((((clock distribution circuit) with (phase detector\$1)) and	USPAT;	2004/03/18 17:43
13	24	((((((clock distribution circuit) with (phase detector\$1)) and (generat\$3 and (clock signal\$1 with error signal\$1))) and (loop	USPAT; US-PGPUB;	2007/03/10 17:43
		filter circuit)) and (pulse generator\$1 and (pulse signal\$1 with	EPO; JPO;	
		clock signal\$1))) and (DERWENT;	
	1	"6066969"	IBM_TDB	
		"6088255"	15/1_/55	
		"4816700"		
		"5870595"		
		"6041073"		
		"4475085"		
		"5212410"		
		"5630102"		
		"5920222"		
		"5952857"		
		"6239647"		
		"4415984"		
		"4479216"		
		RE31828		
		"4613828"		
		"4801819"		
		"4905006"		
		"5210546"		
		"5257294"		
		"5359232"		
		"5459762"		
		"5600839"		
		"5612980"		
	1	"5621705"		
		"5628019"		
		"5633879"		
		"5646672"		
		"5724360"		
		"5774321"		
		"5787261"		
		"5805603"		
		"5901116"		
		"6052004"		
		"6058152"		
		"6078225"		
		"6094076"		
		"6160542"		
		"4361897"		
		"4375088"		
1		"4376268"		
		"4399412"		
		"4454607"		
		"4499459"		
		"4512028"		
		"4527075" "4543347"		
		"4542347" "4542362"		
		"4547667" "4557606"		
]		"4557606" "4590047"		
		"4580047" "4580046"		
	1	"4580046"	1	
)) and (summing and (error signal\$1 with composite error		
14	3492556	signal\$1)) arbiter circuit\$1	USPAT;	2004/02/19 17:42
1 47	3792330	aroica circulat	US-PGPUB;	2004/03/18 17:43
	1		EPO; JPO;	
			DERWENT;	
			IBM_TDB	
			םטו_ויוטג	

T-F	34	//////	LICDAT	2004/02/10 17:11
15	24	(((((((clock distribution circuit) with (phase detector\$1)) and	USPAT;	2004/03/18 17:44
		(generat\$3 and (clock signal\$1 with error signal\$1))) and (loop	US-PGPUB;	
		filter circuit)) and (pulse generator\$1 and (pulse signal\$1 with	EPO; JPO;	
		clock signal\$1))) and (DERWENT;	
		"6066969"	IBM_TDB	
		"6088255"		
		"4816700"		
	1	"5870595"		
		"6041073"		
		"4475085"		
		"5212410"		
	1	"5630102"	İ	
	1	"5920222"		
	1	"5952857"		
		"6239647"		
		"4415984" "4470216"	1	
		"4479216"		
		RE31828		
		"4613828"		
		"4801819"		
		"4905006"		
		"5210546"		
		"5257294"		
		"5359232"		
		"5459762"		
		"5600839"	i	
	1	"5612980"		
		"5621705"		
	1	"5628019"		
		"5633879"		
		"5646672"	İ	
		"5724360" "5724360"		
		"5774321"		
		"5787261"		
		"5805603"		
		"5901116"		
		"6052004"		
		"6058152"		
		"6078225"		
		"6094076"		
		"6160542"		
		"4361897"		
		"4375088"		
		"4376268"		
		"4399412"		
		4399412 "4454607"		
		l'		
		"4499459"		
		"4512028"		
		"4527075"		
		"4542347"		
		"4547667"		
		"4557606"		
		"4580047"		
		"4580046"		
)) and (summing and (error signal\$1 with composite error		
		signal\$1))) and (arbiter circuit\$1)		
16	968045	synchronize local clock	USPAT;	2004/03/18 17:44
	300015		US-PGPUB;	200 1/00/10 1/177
			EPO; JPO;	
			DERWENT;	
	l		IBM_TDB	<u> </u>

17	23	((((((((clock distribution circuit) with (phase detector\$1)) and (generat\$3 and (clock signal\$1 with error signal\$1))) and (loop filter circuit)) and (pulse generator\$1 and (pulse signal\$1 with	USPAT; US-PGPUB; EPO; JPO;	2004/03/18 17:45
		clock signal\$1))) and ("6066969"	DERWENT; IBM_TDB	
		"6088255"	15.155	
		"4816700"		
		"5870595" "C041073"		
		"6041073" "4475085"		
		"5212410"		
		"5630102"		
		"5920222"		
		"5952857"		
		"6239647"		
		"4415984" "4479216"		
		RE31828		
		"4613828"		
		"4801819"		
		"4905006"		
		"5210546"		
		"5257294" "5359232"		
		"5459762"		
		"5600839"		
		"5612980"		
		"5621705"		
		"5628019"		
		"5633879" "5646672"		
		"5724360"		
		"5774321"		
		"5787261"		
		"5805603"		
		"5901116"		
		"6052004" "6058152"		
		6078225"		
		"6094076"		
		"6160542"		
		"4361897"		
		"4375088"		
		"4376268" "4399412"		
		"4454607"		
		"4499459"		
		"4512028"		
	İ	"4527075"		
		"4542347"		
		"4547667" "4557606"		
		4557606 "4580047"		
		"4580046"		
)) and (summing and (error signal\$1 with composite error		
10	205240	signal\$1))) and (arbiter circuit\$1)) and (synchronize local clock)	1	
18	225249	synchroniz\$3 and (phase\$1 with clock signal\$1)	USPAT;	2004/03/18 17:45
			US-PGPUB; EPO; JPO;	
			DERWENT;	
			IBM_TDB	

19	15	(((((((((((clock distribution circuit) with (phase detector\$1)) and (generat\$3 and (clock signal\$1 with error signal\$1))) and (loop filter circuit)) and (pulse generator\$1 and (pulse signal\$1 with clock signal\$1))) and ("6066969" "6088255" "4816700" "5870595" "6041073" "4475085" "5212410" "5530102" "5920222" "5952857" "6239647" "4415984" "44479216" RE31828 "4613828" "4801819" "4905006" "5210546" "5257294" "5359232" "5612980" "5612980" "5621705" "5628019" "5633879" "5646672" "5774321" "5774321" "5787261" "5805603" "5901116" "6052004" "6058152" "6078225" "6078025" "6078025" "6094076" "6160542"	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2004/03/18 17:45
		"6052004" "6058152" "6078225" "6094076"		
20	3861079	"4542347" "4547667" "4557606" "4580047" "4580046")) and (summing and (error signal\$1 with composite error signal\$1))) and (arbiter circuit\$1)) and (synchronize local clock)) and (synchroniz\$3 and (phase\$1 with clock signal\$1)) integrated circuit	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2004/03/18 17:45

21	15	((((((((((((((((((((((((((((((((((((((USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2004/03/18 17:46
		"6052004" "6058152" "6078225" "6094076" "6160542" "4361897" "4375088" "4376268" "4399412" "4454607" "4499459"		
22	3736085	"4527075" "4542347" "4547667" "4557606" "4580047" "4580046")) and (summing and (error signal\$1 with composite error signal\$1))) and (arbiter circuit\$1)) and (synchronize local clock)) and (synchroniz\$3 and (phase\$1 with clock signal\$1))) and (integrated circuit) synchroniz\$3 with clock signal\$1	USPAT; US-PGPUB; EPO; JPO;	2004/03/18 17:46

23	15	((((((((((((((((((((((((((((((((((((((USPAT; US-PGPUB; EPO; JPO; DERWENT;	2004/03/18 17:46
		clock signal\$1))) and ("6066969"	IBM_TDB	
		"6088255" "4816700"		
		"5870595" "6044077"		
		"6041073" "4475085"		
		"5212410"		
		"5630102" "5920222"		
		"5952857"		
		"6239647" "4415984"		
		"4479216"		
		RE31828 "4613828"		
		"4801819"		
		"4905006"		
		"5210546" "5257294"		
		"5359232"		
		"5459762" "5600839"		
	Ì	"5612980"		
		"5621705" "5628019"		
		"5633879"		
		"5646672"		
		"5724360" "5774321"		
		"5787261"		
		"5805603" "5901116"		
		"6052004"		
		"6058152" "6078225"		
		"6094076"		
		"6160542"		
		"4361897" "4375088"		
		"4376268"		
		"4399412" "4454607"		
		"4499459"		
		"4512028" "4527075"		
		"4542347"		
		"4547667" "4557606"		
		"4580047"		
		"4580046"		
		in and (summing and (error signal\$1 with composite error signal\$1))) and (arbiter circuit\$1)) and (synchronize local clock))		
		and (synchroniz\$3 and (phase\$1 with clock signal\$1))) and		
24	72849	(integrated circuit)) and (synchroniz\$3 with clock signal\$1) jitter\$1 or skew	USPAT;	2004/03/18 17:47
			US-PGPUB;	,,
			EPO; JPO; DERWENT;	
	<u></u>		IBM_TDB	_

25	6	((((((((((((((((((((((((((((((((((((((USPAT;	2004/03/18 17:47
		(generat\$3 and (clock signal\$1 with error signal\$1))) and (loop	US-PGPUB;	
		filter circuit)) and (pulse generator\$1 and (pulse signal\$1 with	EPO; JPO;	
		clock signal\$1))) and ("6066969"	DERWENT; IBM_TDB	
		"6088255"	15(1_155	
		"4816700"		
		"5870595"		
		"6041073" "4475085"		
		"5212410"		
		"5630102"		
		"5920222"		
		"5952857" "6230647"		
		"6239647" "4415984"		
		"4479216"		
		RE31828		
		"4613828"		
		"4801819" "4905006"		
		"5210546"		
		"5257294"		
		"5359232"		
		"5459762" "5600839"		
		"5612980"		
		"5621705"		
	,	"5628019"		
	,	"5633879"		
		"5646672" "5724360"		
		"5774321"		
		"5787261"		
		"5805603"		
		"5901116" "6052004"		
		"6058152"		
		"6078225"		
		"6094076"		
		"6160542" "4361907"		
		"4361897" "4375088"		
		"4376268"		
		"4399412"		
		"4454607"		
		"4499459" "4512028"		
		"4527075"		
		"4542347"		
		"4547667"		
		"4557606" "4580047"		
		"4580047" "4580046"		
)) and (summing and (error signal\$1 with composite error		
		signal\$1))) and (arbiter circuit\$1)) and (synchronize local clock))		
		and (synchroniz\$3 and (phase\$1 with clock signal\$1))) and		
		(integrated circuit)) and (synchroniz\$3 with clock signal\$1)) and (jitter\$1 or skew)		
26	2391		USPAT;	2004/03/18 17:50
		714/799.ccls. or 714/814.ccls. or 714/812.ccls.	US-PGPUB;	,,
	[EPO; JPO;	
			DERWENT; IBM_TDB	
Convols 1 the	7/40/24	5·50·26 PM Page 10	100-100	



(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2002/0140477 A1 Zhou et al. (43) Pub. Date: Oct. 3, 2002

- (54) DUTY CYCLE CORRECTION CIRCUIT AND APPARATUS AND METHOD EMPLOYING SAME
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 Payne, Plano, TX (US); Huanzhang
 Huang, Dallas, TX (US); Douglas
 Wente, Plano, TX (US)

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(21) Appl. No.: 09/820,193

(22) Filed:

Mar. 28, 2001

Publication Classification

(51) Int. Cl.⁷ H03K 3/017

(57) ABSTRACT

The duty cycle for a periodic signal such as a clock signal is idealized by feeding back duty cycle information. Duty cycle information is detected by a capacitor connected in serial with a resistor across the outputs of a feedback differential transistor pair. Over time, the capacitor will be charged or discharged when the duty cycle varies from fifty percent. The detected duty cycle information is fed back to an amplifier where the incoming clock signal is mixed with the feedback signal. The amplifier itself comprises a first differential comparator stage receiving the uncorrected clock signal, a gain stage that amplifies and level shifts the feedback signal, and a second differential pair receiving the amplified feedback signal.

